

Auroral Phenomena

It is perhaps worth a note that my daughter saw at Folkestone a very unusual phenomenon on the evening of January 25, a little before 6.30. Some distance to the left of Orion (for the night was clear and starry) she observed a small cloud of a bright golden hue, from which streamers of great brilliancy darted in various directions, the cloud alternately paling and brightening. She describes the streamers as like small meteors, leaving trails of light behind them.

C. M. INGLEBY

Athenæum Club, February 12

Ozone

IN reply to Mr. Capron (NATURE, vol. xxiii. p. 219) the following explanation may perhaps serve:—

On a flat piece of brass two strips of paper are laid, one plain white, the other prepared. With a clean camel-hair brush they are moistened liberally with pure alcohol. This is then burnt off, firing it with a spirit flame; the plain paper remains clear and white, the prepared paper (beginning at the edges) gradually changes to a purple brown. On immersing both strips in clean water the plain paper still remains white, prepared paper changes to a deep purple (No. 8, Negretti's scale).

In about an hour this deep purple colour fades away *precisely in the same way as if the slip had been ozonized by exposure for a day or two to the air*. It may be added that if the prepared slip is not plunged into water the purple brown tint remains for several days.

The experiment suggested by Mr. Capron has been made, using a very delicate gold-leaf electrometer. When this is uncharged there is no apparent effect; when charged either directly or inductively with either positive or negative electricity the gold leaves collapse, the charge appearing to be dissipated with the flame.

I may add, when the leaves are charged the alcohol is lighted on the plate of the electrometer with a glass rod dipped in alcohol, care being taken to prevent the discharge by conduction. The above experiments have been performed in an ordinary study, but I cannot say they are very conclusive.

Mr. Capron states "ozone is very strong just now," and he obtains No. 10 (Negretti's scale) at an inland town. This is a very high number. I have repeatedly obtained this number at Hunstanton on the Wash (Norfolk), where I made experiments daily for a month. The ozone cage was kept in the shade, a fine cloudless day with cold north east wind blowing, and one day's exposure. I have been engaged for some years in testing for ozone on the coast to see if its abundance, or deficiency, is in any way dependent on the physical and geological conditions of the shore. My experiments are not sufficiently advanced to be published, but the three following conditions have always been found to be present where ozone is abundant.

1. A long sandy shore exposed for some hours to the sun's rays.

2. Cloudless sky, with cold north or east wind.

3. An abundance of phosphorescent light from the presence of *Noctiluca miliaris* with the evening flow of tide.

This town is singularly deficient in ozone. After numerous experiments I have as yet only obtained No. 1 (Negretti's scale). Whether this deficiency may not have some connection with our notoriously great infantile mortality of the autumn is a question for further consideration.

J. P.

Leicester, January 27

Citania

I HAVE not had an opportunity of reading NATURE for some time, but I am told that in a late number there is some mention of a so-called "Pompeii" near Braga in Portugal.

I do not presume to write as a learned antiquarian; but having lived for some years within thirty miles of Citania, and having often visited the place and examined the ruins with a wish to gain some explanation of their mystery, I venture to write as an ordinary witness.

In no sense can Citania be described as a Celtic Pompeii; it is merely a collection of circular buildings erected so close to each other as almost to touch, and grouped on the top of a hill which runs out as a spur from the higher ground behind it, and overlooks the rich valley beneath it. The walls have fallen, and the stones which composed them remain *in situ*, generally visible, though more or less overgrown with grass. From the founda-

tions it seems that these round houses must have been some ten feet in diameter internally, with walls eighteen inches thick. The original height of the walls may be inferred, from the quantity of stones fallen, to have been some twelve or fifteen feet.

My utmost examination discovered scarcely anything beyond some shattered bits of coarse pottery. But over the surface of the hill there are still lying about many well-shaped round stones about twenty inches in diameter, which I always thought to be hand millstones. These seemed to me to afford the most likely solution of any mystery connected with the place, and I inferred it was a place of security, to which the corn of the district round was carried. The apparent absence of water forbade the supposition that it was a place of permanent abode. I never could see any necessity for referring its origin to Celtic time. The buildings were probably used, and possibly only date from much later days. Remembering the condition of that district as being the debatable ground lying between the Asturian kingdom in the north and the moors in the south, and open to sudden and transient incursions from either side, the utility of such a place to the farmers of that district seems evident. A Portuguese gentleman, whose name I forget, has so far interested himself in the place as to rebuild one of the circular buildings in what he conceives its original condition, and inside he has collected any remains of antiquarian interest that he could scrape together. Unfortunately his enthusiasm for forming a kind of local museum has led him to carry to it what never belonged to the place. For outside his museum there is a large granite slab, which in character is utterly foreign to the place, and long mystified me. This "Pedra Formosa," as it is called by the neighbouring villagers, is about nine or ten feet long, six feet high, with an average thickness of one foot, and must weigh six or seven tons. It looks like a pretentious *façade* stone, which has survived the building to which it was once attached. It has some carving about it, and signs which may or may not have any meaning in them. But whatever the stone was, it has no right to be where it is; for one day, in a conversation with a local farmer at the inn in the valley, I learnt the fact that some years ago all the farmers of the neighbourhood combined, and yoking thirty-nine pair of bullocks together, dragged the said stone from the valley below, where from time immemorial it had been lying, and added it in triumph to the other objects of the museum.

I may add that during my stay in Portugal I corresponded with the late Senhor Herculano, the Portuguese historian, on the subject, and I believe I have stated his conclusions.

R. BURTON LEACH

Sutton Montis Rectory, Castle Cary, February 8

The Recent Severe Weather

YOUR correspondent H. W. C. in his communication on the above in NATURE, vol. xxiii. p. 329, quotes Mr. Lowe's theory of an eleven-year cycle of "great frosts," and after giving the dates upon which that theory is apparently based, says: "There are some variations in the lengths of the intervening periods, but there is a distinct recurrence of eleven-year epochs."

With the first part of this sentence I quite agree, but I fail to see the very least ground for the latter part of it, the intervals taken in order being as follows:—9, 3, 6, 18, 3, 16, 4, and 10 years. Three intervals approximating to eleven years can be "screwed" in by manipulating the years between which you reckon, disregarding inconvenient ones and using others which suit better; but surely this cannot be held sufficient to justify the statement, such a method of dealing with the figures being, it is scarcely necessary to point out, quite unallowable.

I have noticed before that when the discovery of similar epochs for abnormal heat, cold, rain, &c., have been announced, a similar method of dealing with dates has been followed to that which seems to have been adopted in this case.

F. M. S.

February 3

THE epochs which show recurrence are obtained by "manipulating" the figures in the following manner:—

December 1801 to January 1814, interval 12 years 2 months.

" 1810 " 1820, " 9 " 2 "

" 1840 " 1861, " 20 " 2 "

(It should here be remarked that a *long* but not "great" frost was experienced in the winter of 1849-50; as it was not severe enough to entitle it to the designation of great frost it was

omitted from the table; if it had been inserted the 20 years and 2 months period would have counted as two 10 year periods.)

December 1860 to January 1841, interval 10 years 2 months.

„ 1870 „ 1881, „ 10 „ 2 „

Thus at least four periods (out of a possible seven) do not require much "screwing" to make them approximate to 11-year epochs; while if we were to add in the *long* frost of 1850 we should have no less than six periods, showing a distinct recurrence.

It may not be quite clear why the remaining dates are inserted; but if they are analysed in the following manner they are not uninteresting.

December 1813 to January 1838, interval 22 years 2 months.

„ 1837 „ 1857, „ 19 „ 2 „

These periods, like the one 1840 to 1861, tend to show that the intervals approximate nearer to 22 years. How does F. M. S. obtain the intervals he quotes? As regards the last paragraph of the letter of F. M. S. respecting the "abnormal heat, cold, rain, &c.," it is only necessary to say that he would have considerable difficulty to prove to Norman Lockyer, Meldrum, and others, that 11-year cycles do not exist, even if F. M. S. "screwed" his figures, as he seems to have done in his letter above.

H. W. C.

Butterflies in Winter

A COUNTRYMAN has shown me to-day two fine specimens of *Vanessa urtica* in a lively condition caught on the 4th inst. in an empty room on the border of the New Forest, exposed to the severity of the late frost.

THOMAS W. SHORE

Southampton, February 8

JOHN GOULD, F.R.S.

THE grave has recently closed over the remains of a very remarkable man, and although the annals of science, we are proud to think, afford many instances of indomitable energy and unceasing perseverance rewarded, they have no greater record of success than is to be found in the life of John Gould. No one can regard the series of works written and illustrated by him without acknowledging that they are a monument of human energy, and the story of his life makes the fulfilment of these large enterprises the more interesting. In the character of the man we must look for the secret of his success, because it is well known that he possessed neither the advantages of wealth nor education at the commencement of his career, and yet he has left behind him a series of works the like of which will probably never be seen again; and this because it is rare to find the qualities of a naturalist, an artist, and a man of business combined in one and the same person. John Gould was all these in an eminent degree: he knew the characters of birds as well as any man living, and although it has often been said that he made too many species—and latterly it has been the fashion with certain writers to sink a good many of them—yet the monographer, travelling over the ground again, generally finds that the critic, and not Gould himself, was at fault. As an artist he possessed talent combined with the greatest taste, and this, added to the knowledge of botany, acquired in his early days, enabled him to give to the world the most beautiful series of pictures of animal life which have yet been produced. Certain special works, where the pencils of Wolf or Keulemans have been employed, many vie with those of Gould, but taken in a collective sense, his splendid folios, full of coloured plates, are as yet without a rival. That he was a good man of business the fact that his writings were not only self-supporting, but further realised him a considerable fortune, is the best proof. Though in outward seeming he was stern and even somewhat brusque in manner, those who knew him well can vouch for the goodness of his heart, and can tell of many an act of kindness and charity, concealed from the world under a bluff exterior, and no one ever heard him speak unkindly of any of his contemporaries. Straightforwardness was one of his especial characteristics, as well as an exact manner of doing business, paying for everything

the moment the work was done; and this probably accounts for the way in which his artists, lithographers and colourers, worked for him for long periods of years.

Mr. Gould at his death was in his seventy-seventh year, having been born in September, 1804. He was a native of Lyme in Dorsetshire, but when quite an infant his parents moved to the neighbourhood of Guildford. When he was fourteen years of age his father was appointed a foreman in the Royal Gardens at Windsor, under Mr. J. T. Aiton, and here the lad had a grand opportunity of studying British birds in a state of nature; in his collection are still to be seen two magpies shot by himself and stuffed at the age of fourteen, which are even now most creditable specimens of taxidermy, and foreshadowed the excellence which he afterwards attained to in that art. Till the year 1827, when he came to London, he was still employed in active gardening, having left Windsor for a post at Sir William Ingleby's at Ripley Castle in Yorkshire. Immediately after coming to town he was appointed curator to the Zoological Society's Museum, at that time in its infancy, and he enjoyed the intimate friendship of Mr. N. A. Vigors, then one of the leading English naturalists, and through him John Gould received his first opportunity of appearing as an author. So rare were Himalayan birds in those days that a small collection was thought worthy of description by Mr. Vigors in the *Proceedings* of the Zoological Society, and the figuring of these specimens was commenced by Mr. Gould under the title of "A Century of Birds from the Himalayan Mountains." By this time however an event had taken place which had an influence on the whole of his later life, viz., his marriage with Miss Coxen, the daughter of Mr. Nicholas Coxen of Kent. Besides her other accomplishments Mrs. Gould was an admirable draughtswoman, and, from her husband's sketches, she transferred to stone the figures of the above-named work. Its success was so great that in 1832 the "Birds of Europe" was commenced, and finished in five large folio volumes in 1837, while simultaneously, in 1834, he issued a Monograph of the Rhamphastidæ or family of Toucans, and in 1838 a Monograph of the Trogonidæ or family of Trogons. To the last he maintained his love for these birds, and one of his most recently finished works was a second edition of the last-mentioned Monograph. It is a curious fact that when John Gould proposed to publish his first work, he applied to several of the leading firms in London, and not one of them would undertake to bring it out, so that it was only with reluctance that he began to issue the work on his own account. Besides these larger publications he had described the birds collected during the voyage of the *Beagle* by his friend Mr. Darwin, and had contributed papers on other subjects to the Zoological Society's publications.

We now come to what we consider the most striking incident in Mr. Gould's life, one unsurpassed in its effects in the annals of ornithology. Beyond a few scattered descriptions by some of the older authors and an account of the Australian birds in the museum of the Linnean Society, by Messrs. Vigors and Horsfield, the birds of Australasia were very little known at the date we speak of. Accompanied therefore by his devoted wife, Mr. Gould proceeded in 1838 to study Australian birds in their own home, and he personally explored Tasmania, the islands in Bass's Straits, South Australia, and New South Wales, travelling 400 miles into the interior of the latter country. This voyage, specially undertaken for the purpose of obtaining an exact knowledge of Australian birds, must ever be reckoned as a distinct scientific achievement, and the accounts of the habits of some of the more remarkable species, such as the mound-building Megapodes and the Bower birds were quite triumphs in the way of field ornithology. Nests and eggs were collected as well as an excellent series of skins, both of mammals and birds, and here Mr. Gould's beautiful method of